

# OUTLINE

## FOR

### REFORMATTED 450-601-NOSP/SPACE SHUTTLE

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Discuss mission emergencies briefly & ref to:

STDN Contingency Action Plan, 534-CAP-Space Shuttle

GSFC SSP Contingency Support Plan, 534-CAP-GSFC

SSP Emergency Mission Control Center Activation and Operations

Procedures, 540-CAP-EMCC

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1.8.3 Data Stream Assignments (N intro to Appen C)

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(Typical Station Section N - Combined old sections 1, 4, 5, 6, 12, 14, & 26)

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- 2.7.3.3.5 FOXTROT; FlightOperations, EVA
  - 2.7.3.3.6 GOLF; GN EVA/EMU (Throughput)
  - 2.7.3.3.7 HOTEL; Landing
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  - 2.7.3.3.9 JULIET; WSSH Landing/Post-landing
  - 2.7.3.3.10 KILO; Contingency Landing
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- Figure 2.7-1. Prelaunch (Throughput) Until SRB Ignition A-G Configuration ALPHA

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## **Section 3. Meritt Island/Ponce De Leon**

(USE SAME PARA, TABLES AND FIGURES AS IN SECTION 2 – DRYDEN)

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(USE SAME PARA, TABLES AND FIGURES AS INSECTION 2 – DRYDEN)

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4.2.2.8.6 SLSS Return Link Control Panels

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4.2.2.10.1 Magnetic Tape Recorder

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4.2.3.2 Link Description

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Figure 4.2-5. Launch Support Configuration (M old Fig 1-13)

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4.3.2.2 Launch Pad Support

4.3.2.3 Scheduling/Predicted Coverage

4.3.2.4 Link Description and MOD Indices

4.3.2.4.1 OD DL (2217.5/2287.5 MHz PM Ops)

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4.3.2.4.3 PM UL

4.3.2.4.4 Shuttle Uplink Mod Index Procedures

4.3.2.4.5 Space Shuttle Verification Receiver Alignment

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Table 4.3-2. FM DL, 2250.0-MHz FM Ops Downlink Mod Indices

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Table 4.3-4. Space Shuttle RER Preset Assignments

4.3.3 Operational Support Procedures

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4.3.3.1.2 Exciter and PA Control

4.3.3.1.3 RER Upgrade Range Equipment

Table 4.3-5. MFR Configuration for FM DL - 2250.0 MHz

4.3.3.2 Acquisition Sources and Procedures

4.3.3.2.1 GN

4.3.3.2.2 Procedures

4.3.3.2.3 Station H/O

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(USE SAME PARA, TABLES AND FIGURES AS IN SECTION 2 – DRYDEN)

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- 5.3.6 S-band Pass Event Reporting (N)
 

[Table 5.3-9. MIL/PDL/DFRC/WPS Announcements for Loss of Carrier/Modulation \(M old Tab 1-10\)](#)
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5.6.2.2 Voice Recorder Configuration

Table 5.6-1. Digital Voice Recorders Configuration

5.6.2.3 Postlanding Support from DFRC (M old Pa 1.3.4.2)

5.6.2.4 Contingency Landing Communications (M old Pa 1.3.4.3)

## 5.7 Air-to-Ground Communications (M old section 14)

5.7.1 General

5.7.2 Voice Communication Modes

5.7.2.1 Space Shuttle Definition

5.7.2.2 S-band

Table 5.7-1. Station A-G Equipment Allocations

Table 5.7-2. Shuttle Communications Modes

5.7.2.3 UHF

5.7.2.4 Technical Characteristics

5.7.3 Operations Procedures and Configurations

5.7.3.1 Procedures

5.7.3.2 Equipment Configurations

5.7.3.3 A-G Configurations

5.7.3.3.1 ALPHA; Pre-launch (Throughput) Until SRB Ignition

5.7.3.3.2 BRAVO; Ascent Throughput A-G

5.7.3.3.3 CHARLIE; Flight Operations (Orbit) UHF

5.7.3.3.4 DELTA; Flight Operations, Orbit (Throughput)

5.7.3.3.5 FOXTROT; Flight Operations, EVA

5.7.3.3.6 GOLF; GN EVA/EMU (Throughput)

5.7.3.3.7 HOTEL; Landing

5.7.3.3.8 INDIA; Ground Operations, Post-landing

5.7.3.3.9 JULIET; WSSH Landing/Post-landing

5.7.3.3.10 KILO; Contingency Landing

5.7.3.3.11 LIMA; RTLS/KSC Landing/Post-landing

5.7.3.3.12 Pre-launch/Landing Weather Aircraft Configuration

Figure 5.7-1. Prelaunch (Throughput) Until SRB Ignition A-G  
Configuration ALPHA

Figure 5.7-2. Ascent (Throughput) A-G Configuration BRAVO

Figure 5.7-3. Flight Ops UHF Configuration CHARLIE

Figure 5.7-4. Flight Ops A-G Configuration DELTA

Figure 5.7-5. Flight Operations (EVA) Ops A-G Configuration  
FOXTROT

Figure 5.7-6. Flight Ops UHF Configuration GOLF

Figure 5.7-7. DFRC Landing A-G Configuration HOTEL

Figure 5.7-8. DFRC Postlanding A-G Configuration INDIA

Figure 5.7-9. WSSH Contingency Landing/Postlanding A-G  
Configuration JULIET

Figure 5.7-10. Contingency Landing A-G Configuration KILO

Figure 5.7-11. RTLS/KSC Landing/Postlanding Configuration LIMA

Figure 5.7-12. Prelaunch/Launch Weather Aircraft Configuration

5.7.3.4 UHF Pass Event Reporting (M from 1.3.1.7)

5.7.3.5 JSC to DFRC UHF Communications Failure (N )

5.7.3.6 Tone Keying Failure (UHF) (M old Pa 1.3.4.1)

## 5.8 Testing and Simulations (M old section 26)

5.8.1 General

5.8.2 Mission Readiness Test

5.8.3 Prelaunch Simulations

5.8.3.1 Network Simulations

5.8.3.2 GSFC Simulations

5.8.4 Timeline for MRT for Space Shuttle

5.8.4.1 General

5.8.4.2 Events

5.8.5 MIDDs Fault Isolation Procedure (Metosat Data) (M old Pa 1.3.6.2)

Figure 5.8-1. WFF MIDDs Data Flow (M old Fig 1-10)

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### **6.2 Operational Communications**

6.2.1 Introduction

6.2.2 Operational Systems

### **6.3 Mission Participation**

6.3.1 Planning Phase

6.3.2 Planning Data

6.3.3 Terminal Count Support

6.3.4 Displays

6.3.5 Data Validation

6.3.6 Fault Isolation

### **6.4 Acquisition Data**

6.4.1 General

    6.4.1.1 Space Shuttle Flights

    6.4.1.2 Acquisition Data Responsibilities

6.4.2 Pre-mission Phase

    6.4.2.1 Nominal Acquisition Data

    6.4.2.2 Contingency Acquisition Data

6.4.3 Mission Phase Acquisition Data

    6.4.3.1 General

    6.4.3.2 Onorbit Phase

    6.4.3.3 Maneuvers

    6.4.3.4 Entry/Landing Phase

    6.4.3.5 Retransmission of Acquisition Data

### **6.5 C-Band and S-Band Station Antenna Identification**

Figure 6-1. Space Shuttle PDL Station Communications (M old Fig 8-1)

Table 6-1. Space Shuttle Station Identification

Table 6-2. Prime Acquisition Message Distribution by Mission Phase (1, 2, 3)

Table 6-3. Contingency and Landing Acquisition Data Trajectory Codes

Table 6-4. Ground Network Facility Vehicle Contingencies

Table 6-5. Ground Network Facility Contingencies

## **6.6 GSFC Bypass Acquisition Data Plan**

## **Section 7. Communications – NISN** (M old section 8)

### **7.1 General**

- 7.1.1 Introduction
- 7.1.2 NISN Systems
- 7.1.3 NISN Data Systems
- 7.1.4 Voice Systems
  - 7.1.4.1 General
  - 7.1.4.2 PDL T-1/ Voice Communications for Space Shuttle Support
  - 7.1.4.3 Voice Coordination

Table 7-1. Space Shuttle Voice Circuit Description

- 7.1.5 Tracking Data Systems
- 7.1.6 Video System
- 7.1.7 Meteorological Interactive Data Display System

Figure 7-2. Space Shuttle Orbital Phase Acquisition and Tracking Data System

- 7.1.8 Transoceanic Abort Landing Communications

### **7.2 Operations**

- 7.2.1 General
  - 7.2.2 Documentation
- Figure 7-3. TAL 4-Wire Voice Circuit Distribution
- 7.2.3 NISN Communications Manager
  - 7.2.4 NISN Network Scheduling Group
  - 7.2.5 Operations Tests
  - 7.2.6 Communications Configurations
  - 7.2.7 Operational Failures or Deficiencies
  - 7.2.8 IP Network
    - 7.2.8.1 General
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Figure 7-4 NISN IP Transition Configuration

7.2.8.4 Real-time Transport Protocol

7.2.8.5 Multicast Open Shortest Path First

7.2.8.6 Simple Network Management Protocol

7.2.8.7 Infrastructure Components

Figure 7-5. IP Transition Infrastructure

7.2.8.8 Basic Data Transport Scenarios

7.2.8.9 IP Multicasting Routing

7.2.8.10 Conversion Device Data Routing

7.2.8.11 Modified MDMs

7.2.8.12 IP Conversion Device Management

7.2.8.13 Self Encapsulation

7.2.8.14 Self Managed

7.2.8.15 Space Shuttle Configurations

7.2.8.16 Johnson Space Center

7.2.8.17 MIL/PDL (KSC)

Figure 7-6. JSC SCD Configuration for 192K OD Smoothing

Figure 7-7. 72K Shuttle Command

Figure 7-8. Shuttle GN Contingency Return

7.2.8.18 Onizuka Air Force Station

7.2.8.19 Dryden Flight Research Center

7.2.8.20 Wallops Island

7.2.8.21 Marshall Space Flight Center

7.2.9 Circuit Description

7.2.9.1 Wideband Data Circuits

7.2.9.2 Narrowband Data Circuits

Figure 7-9. Space Shuttle Wideband Circuits

Figure 7-10. Space Shuttle FCO Circuiting

Figure 7-11. Space Shuttle Landing Phase Tracking Data System (EAFB Landing/  
WSMR Landing)

Figure 7-12. WSSH Landing Tracking System

Figure 7-13. Space Shuttle Launch and Return to Launch Site Phase Tracking Data System

7.2.9.3 Video Circuits

7.2.9.4 Video Troubleshooting Procedures

7.2.9.5 Contingency Landing Sites

Figure 7-14. Space Shuttle Video Circuits

Table 7-2. Television Circuit Troubleshooting Procedures

## Section 8. NIC/Station Interface (M old section 16)

### 8.1 NIC/Network Standard Operating Procedures

### 8.2 Documentation, Scheduling, and Reporting Standard Operating Procedures

### 8.3 Message Formats and Method of Delivery

8.3.1 General

8.3.2 Four-Letter Designators

8.3.3 Interim Support Instruction (ISI) Message

8.3.4 Request for Information or Clarification (RIC)

8.3.5 Documentation Change Notice (DCN) General Header Format

8.3.6 Operations (OPN) Message

[Station Equipment Status Report (ESR) ...deleted]

[Problem Report (PRT) Message ....deleted]

(Computer Software, Hardware Anomaly Message ....deleted)

8.3.7 Radio Frequency Interference (RFI) Report Message

8.3.8 Spacecraft/Vehicle Anomaly (SVA) Report

8.3.9 Space Shuttle Contingency Plan (SCP) (Sample)

(Data Shipment Advisory Message ...deleted)

8.3.10 Support Request Message

8.3.11 Briefing Message Request

8.3.12 Tracking Summary Message (Teletype) - C-band Message Format

8.3.13 MIL-originated S-band CRF Message (Non-nominal) (Teletype)

8.3.14 Space Shuttle Launch Count Status

8.3.15 Space Shuttle Liftoff Time

8.3.16 DOD Weather Report

8.3.17 Station Postmission Reporting Message

8.3.17.1 General

8.3.17.2 Message Format

## Section 9. Radar (M old section 3)

### 9.1 General

### 9.2 Launch Phase

### 9.3 Orbit Phase

### 9.4 Landing Phase

#### 9.4.1 General

Table 9-1. Launch Phase Data Identification Parameters

Table 9-2. Vehicle Identification Codes for Space Shuttle

Figure 9-1. Launch Phase C-band Metric Data System

Figure 9-2. Orbit Phase C-band Metric Data System

Figure 9-3. Landing Phase C-band Metric Data System (KSC Landing)

LTAS (TEFG-smooth) 2400 b/sec

Figure 9-4. Landing Phase C-band Metric (High Rate) Data System for Space Shuttle  
(Northrup Strip or EAFB Landings)

Figure 9-5. Landing Phase C-band Metric Acquisition Data System for Space  
Shuttle (WSSH or EAFB Landings)

Figure 9-6. Landing Phase C-band Metric (Low Rate) Acquisition Data System for  
Space Shuttle (Northrup Strip or EAFB Landings)

Figure 9-7. AOA Landing Phase C-band Metric (High Rate) Data System for Space  
Shuttle Northrup Strip Landings

#### 9.4.2 Landing Phase Computing Center Support

#### 9.4.3 Landing Phase Acquisition

### 9.5 Tracking Coordination Voice Communications Circuit

### 9.6 DOD Radars

#### 9.6.1 General

#### 9.6.2 Phasing

#### 9.6.3 Atmospheric Refraction Correction

#### 9.6.4 Onsite Weather Observations/Reporting

#### 9.6.5 Frequencies

9.6.6 Data Disposition

**9.7 Wallops Island Support Procedures**

9.7.1 Documentation

9.7.2 Requirements

9.7.3 Tracking Data

    9.7.3.1 Launch Support

    9.7.3.2 Launch/Ascent Radar Requirements and Preferences

    9.7.3.3 Wallops Island Launch/Ascent Contingency Main Engine Failure Support

    9.7.3.4 Orbital Support

9.7.4 Acquisition Data

9.7.5 Support Configuration

    9.7.5.1 C-band Support

    9.7.5.2 PRF

9.7.6 Low-Speed Data Header

9.7.7 C-Band Acquisition Procedures

9.7.8 System Recorders

9.7.9 Data Disposition

9.7.10 Phasing

9.7.11 Atmospheric Refraction Correction

9.7.12 Reporting

**9.8 United States Space Command ET Support**

9.8.1 Launch Phase Support

9.8.2 Orbital Support

## **Section 10. Data Management**

### **10.1 General**

### **10.2 Data Requirements and Disposition**

#### 10.2.1 Testing

##### 10.2.1.1 Pre-launch Testing

##### 10.2.1.2 Validation Testing

#### 10.2.2 Launch Through Mission Termination

#### 10.2.3 DOD Data Disposition

#### 10.2.4 Post-mission Data Requirements and Disposition

### **10.3 Data Requests**

### **10.4 Data Retention**

### **10.5 Data Labels**

### **10.6 Shipping**

#### 10.6.1 General

#### 10.6.2 STDN Stations Shipments

#### 10.6.3 Shipping Addresses

### **10.7 Tape Numbering**

### **10.8 Data Identification**

### **10.9 Space Shuttle Private Conversations**

Figure 10-1. STDN Label 2166, Space Shuttle Private Conversations

Table 10-1. MIL Data Requirements and Disposition

Table 10-2. PDL Data Requirements and Disposition

Table 10-3. WFF Data Requirements and Disposition

Table 10-4. WSMR Data Requirements and Disposition

## **Section 11. Television** (M old section 25)

### **11.1 General**

- 11.1.1 Space Shuttle Closed-Circuit Television System
- 11.1.2 Station Television Systems Station Configuration

### **11.2 Operating Procedures**

- 11.2.1 Pre-pass Validation
- 11.2.2 Video Recording Requirements for VO-5600 VCRs
- 11.2.3 Audio Recording Requirements for VCR Audio Track
- 11.2.4 Video and Audio Recording and Playback Procedures
- 11.2.5 VTR Dump at STDN Station Procedures

### **11.3 Remoting Requirements**

### **11.4 Typical Pass Activities**

### **11.5 Handover Procedures**

Table 11-1. Typical Pass Activities

### **11.6 MIL TV Configuration**

### **11.7 Pilot's Point of View Television**

### **11.8 External Tank Television System (TBS)**

## **Section 12. Equipment Modifications** (M old section 17)

### **12.1 General**

### **12.2 STDN Implementation Schedule**

#### **12.2.1 General**

#### **12.2.2 Configuration Freeze**

#### **12.2.3 Exemptions**

### **12.3 Engineering Changes**

### **12.4 Request for Modification**

### **12.5 Other Equipment Modifications**

### **12.6 Status Reports**

**Appendix A – Referenced Abbreviations and Acronyms (R)**

**Appendix B – Supporting Documents and Related Web Sites (N)**

**Appendix C – Data Stream Assignments (N)**